Development of Statewide Model Post-Processors for Traffic and Economic Forecasting

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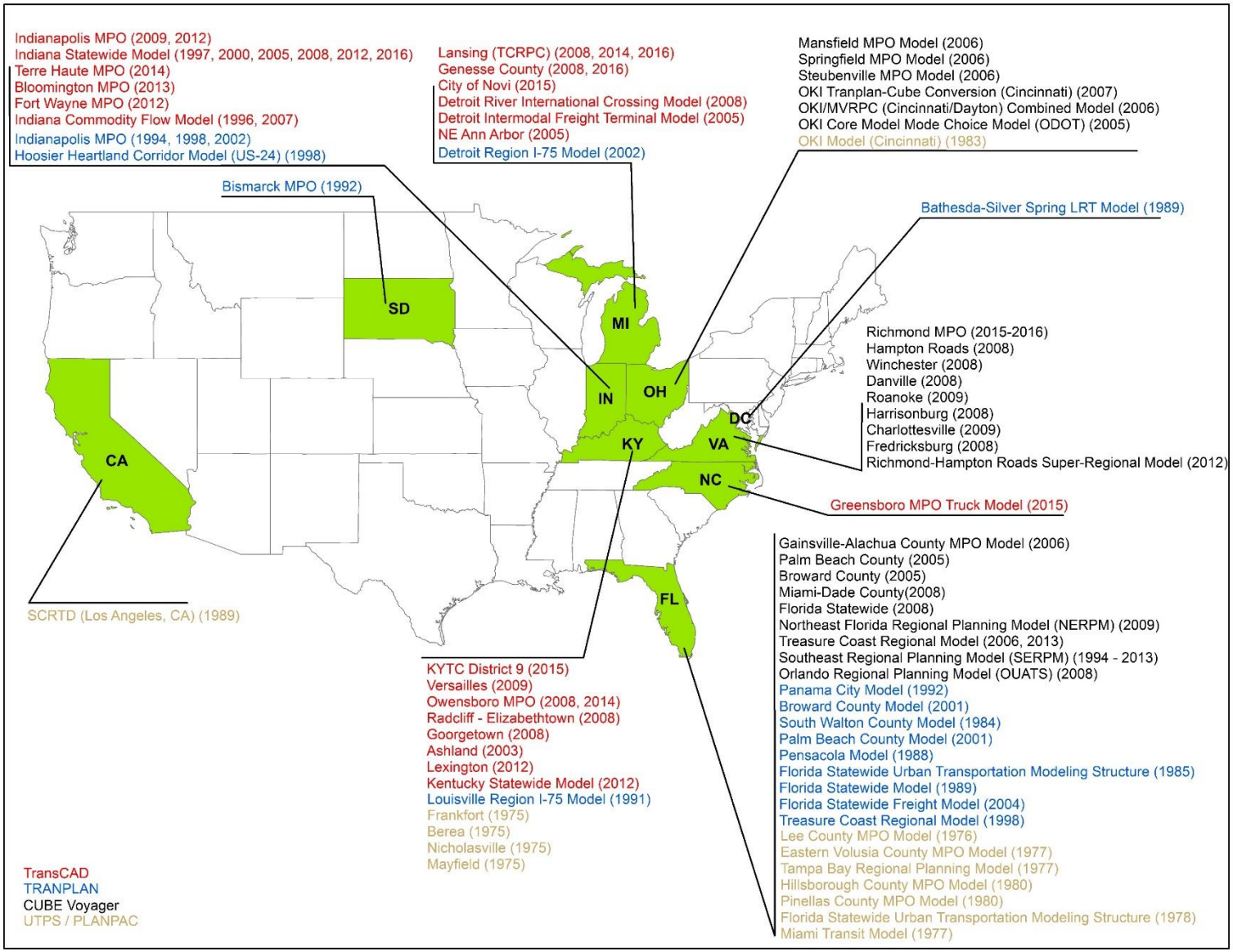
Outline

- Introduction
- Part 1 – INDOT Traffic Forecasting Tool (TFT)
- Part 2 – KYTC TREDIS Post-Processor

Introduction



Introduction (cont.)

Currently in Mid-West …

- **Indiana Department of Transportation (INDOT)**
  - On-call Long Range Transportation Planning Service, e.g., TFT
  - Update Indiana Statewide Travel Demand Model (ISTDM)
- **Kentucky Transportation Cabinet (KYTC)**
  - On-call Travel Demand Modeling Services, e.g., TREDIS post-processor
  - Update Kentucky Statewide Traffic Model (KYSTM)

Part 1

INDOT Traffic Forecasting Tool (TFT)

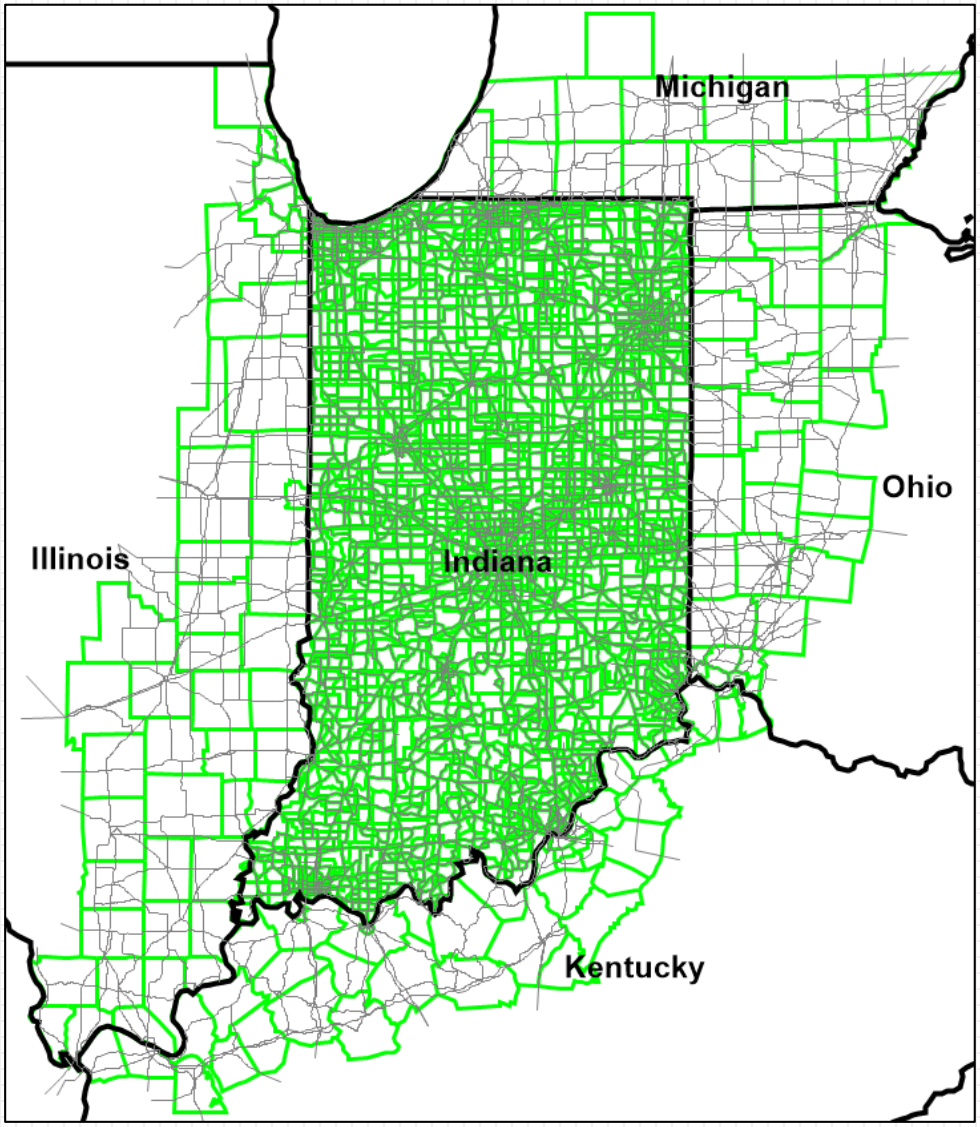
Overview

- **INDOT maintains a TFT to facilitate traffic forecasting activities.**
- **Old TFT v2.0 – developed in 2006**
- **TFT v3.0** (completed under current INDOT On-Call LRTP contract)
  - **Compatible with the latest Indiana Statewide Travel Demand Model (ISTDM 7) in TransCAD 6**
  - **The most current traffic count data**
  - **Enhanced GUI**
  - **Improved traffic forecasting models**
  - **Multiple links (up to 15) for analysis at a time**
  - **More key link attributes**
  - **More effective & manageable outputs (.BIN reports & graphs)**

ISTDM 7

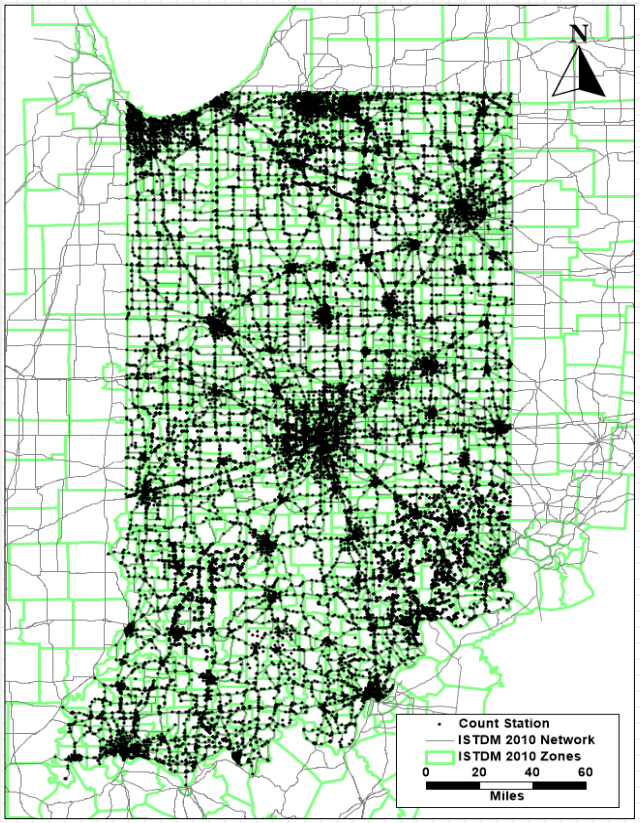
- 4-step model (TransCAD 6)
- Coverage – entire IN + partial IL, KY, MI, OH
- 4879 zones & 46780 links
- Modes
  - auto, freight, LD transit
  - tolling
- Model years 2010 – 2035 with 5-year increment
- Currently being updated.

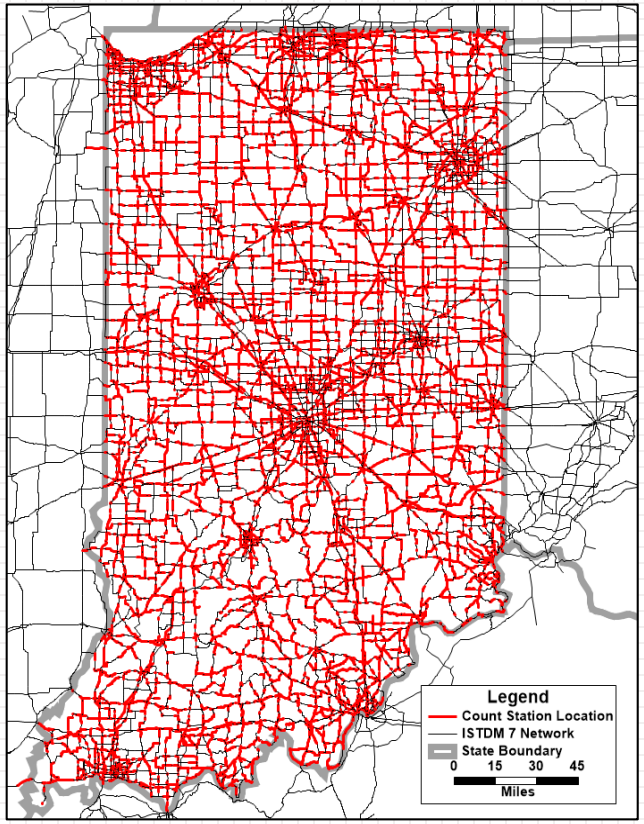
TFT v3.0 uses ISTDM7 2015 & 2035 model run results.



Traffic Data

- INDOT's Traffic Count Database System (TCDS)
- Use recent data (2001 – current)
- Tag count stations GIS layer & data to ISTDM 7 network





11,558 links has data

Forecasting Models in TFT v3.0

- Linear
- Linear Regression
- Exponential
- Adjusted Exponential
  - Indiana Traffic Growth Profile
- NCHRP 255 Calibration Procedure

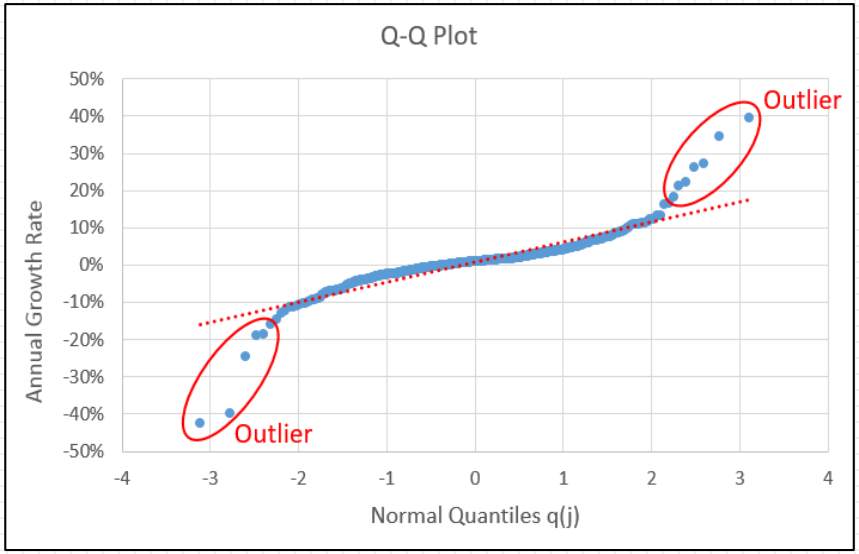
Indiana Traffic Growth Profile

- **A set of reasonable ranges of traffic growth rates – improve the Exponential model in TFT v3.0**
- **In current TCDS, 69% of count stations and 76% of AADT records only have data of 2010 or later.**
- **Short-term historical counts may introduce abnormal growth rates (outliers) that are associated with transient events.**

Indiana Traffic Growth Profile (cont.)

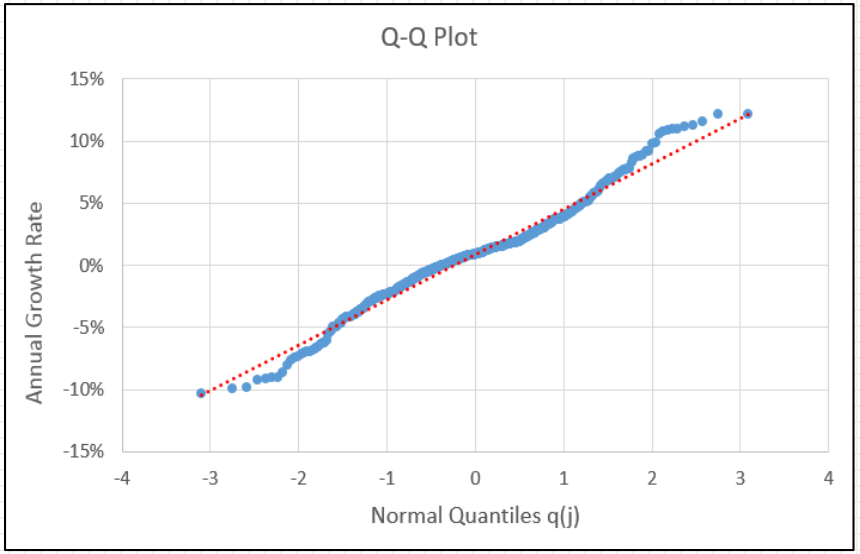
- **Use Q-Q plot to filter outliers (normally distributed data should follow a straight line with correlation coef. = 1.0)**

Example: Rural Interstate (raw data)



correlation coef. = 0.89

Example: Rural Interstate (cleaned data)



correlation coef. = 0.99

Indiana Traffic Growth Profile (cont.)

Cleaned Data

Functional Classification	Rural			Urban		
	99% CI - Lower	Mean	99% CI - Upper	99% CI - Lower	Mean	99% CI - Upper
1 - Interstate	0.46%	0.88%	1.31%	1.04%	1.28%	1.52%
2 - Other Freeway or Expressway	0.88%	1.89%	2.90%	0.59%	1.13%	1.67%
3 - Other Principal Arterial	0.07%	0.26%	0.46%	-0.02%	0.13%	0.29%
4 - Minor Arterial	-0.08%	0.08%	0.25%	0.45%	0.57%	0.70%
5 - Major Collector	-0.06%	0.02%	0.10%	0.07%	0.33%	0.60%
6 - Minor Collector	-1.61%	-0.61%	0.39%	0.57%	0.84%	1.11%
7 - Local	-1.39%	-0.56%	0.26%	1.01%	1.44%	1.87%

Indiana Traffic Growth Profile (cont.)

Cleaned Data

Functional Classification	Rural			Urban		
	99% CI - Lower	Mean	99% CI - Upper	99% CI - Lower	Mean	99% CI - Upper
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3 - Other Principal Arterial	0.07%	0.26%	0.46%	-0.02%	0.13%	0.29%
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5 - Major Collector	-0.06%	0.02%	0.10%	0.07%	0.33%	0.60%
6 - Minor Collector	-1.61%	-0.61%	0.39%	0.57%	0.84%	1.11%
7 - Local	-1.39%	-0.56%	0.26%	1.01%	1.44%	1.87%

vs.

Raw Data

Functional Classification	Rural			Urban		
	Min	Mean	Max	Min	Mean	Max
1 - Interstate	-42.53%	0.83%	39.31%	-34.31%	1.21%	33.52%
2 - Other Freeway or Expressway	-10.65%	1.89%	14.98%	-46.94%	0.54%	41.54%
3 - Other Principal Arterial	-26.08%	-0.22%	23.11%	-65.92%	-0.06%	57.37%
4 - Minor Arterial	-64.81%	0.00%	33.51%	-65.32%	0.33%	46.55%
5 - Major Collector	-58.93%	-0.50%	62.66%	-79.46%	0.35%	112.86%
6 - Minor Collector	-32.24%	-0.46%	68.87%	-46.31%	-1.29%	17.75%
7 - Local	-56.53%	-1.26%	45.97%	-52.38%	-0.07%	10.66%

Indiana Traffic Growth Profile (cont.)

Cleaned Data

Functional Classification	Rural			Urban		
	99% CI - Lower	Mean	99% CI - Upper	99% CI - Lower	Mean	99% CI - Upper
1 - Interstate	0.46%	0.88%	1.31%	1.04%	1.28%	1.52%
2 - Other Freeway or Expressway	0.88%	1.89%	2.90%	0.59%	1.13%	1.67%
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7 - Local	-1.39%	-0.56%	0.26%	1.01%	1.44%	1.87%

$$GF_{adj} = \begin{cases} CI_{99\%,l}, & if\ GF < CI_{99\%,l} \\ GF, & if\ CI_{99\%,l} \leq GF \leq CI_{99\%,u} \\ CI_{99\%,u}, & if\ GF > CI_{99\%,u} \end{cases}$$

NCHRP 255 Adjustment Procedure

- **Ratio adjustment** $A_{ratio} = \frac{COUNT}{A_b} \times A_f$
- **Difference adjustment** $A_{difference} = (COUNT - A_b) + A_f$
- **Final adjustment** $RA_f = \frac{A_{ratio} + A_{difference}}{2}$

where:

$COUNT = base\ year\ traffic\ count$

$A_b = base\ year\ model\ volume$

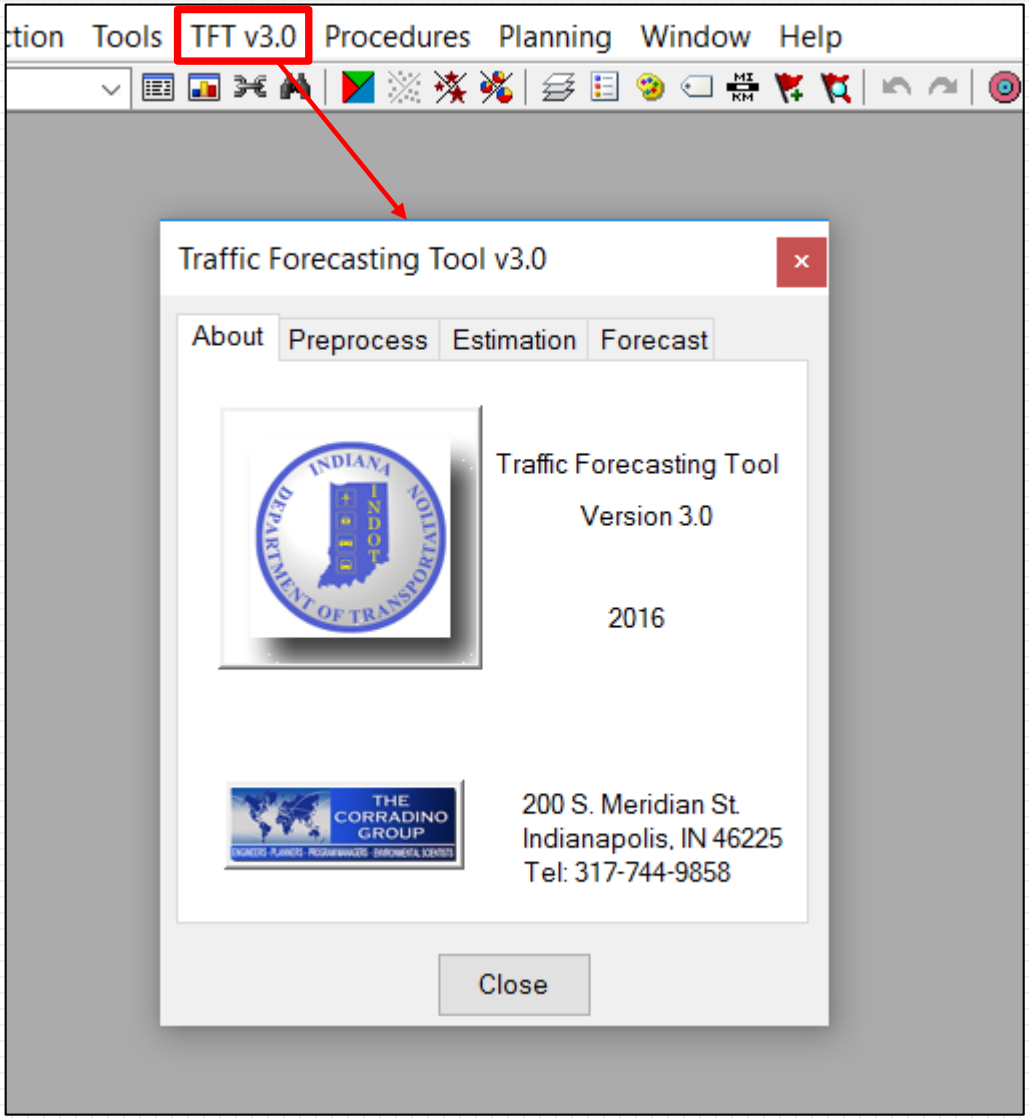
$A_f = future\ year\ model\ volume$

$A_{ratio} = future\ year\ volume\ based\ on\ ratio\ adjustment$

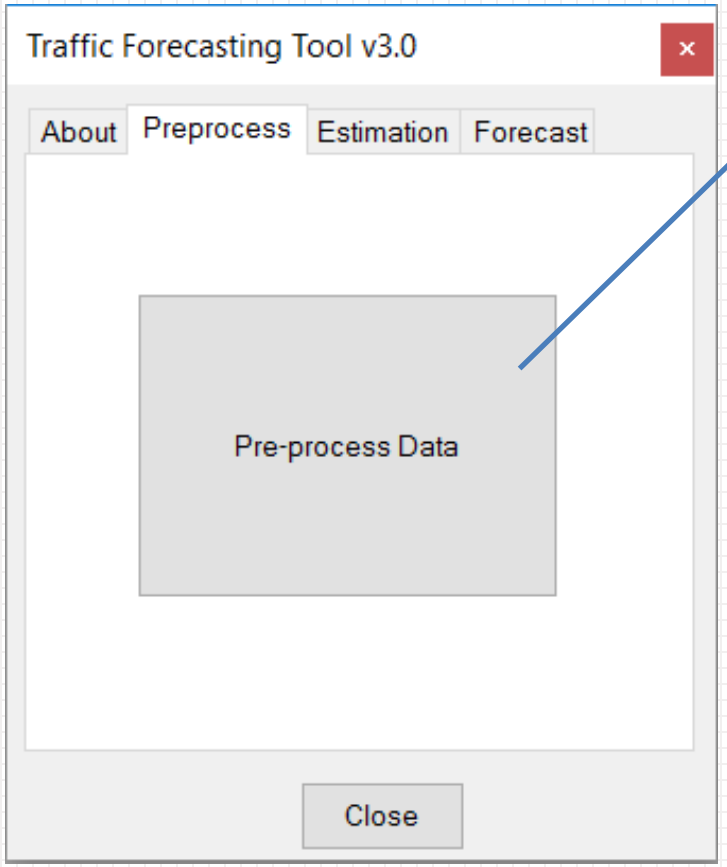
$A_{difference} = future\ year\ volume\ based\ on\ difference\ adjustment$

$RA_f = final\ adjusted\ future\ year\ volume$

TFT v3.0 – “About” Tab

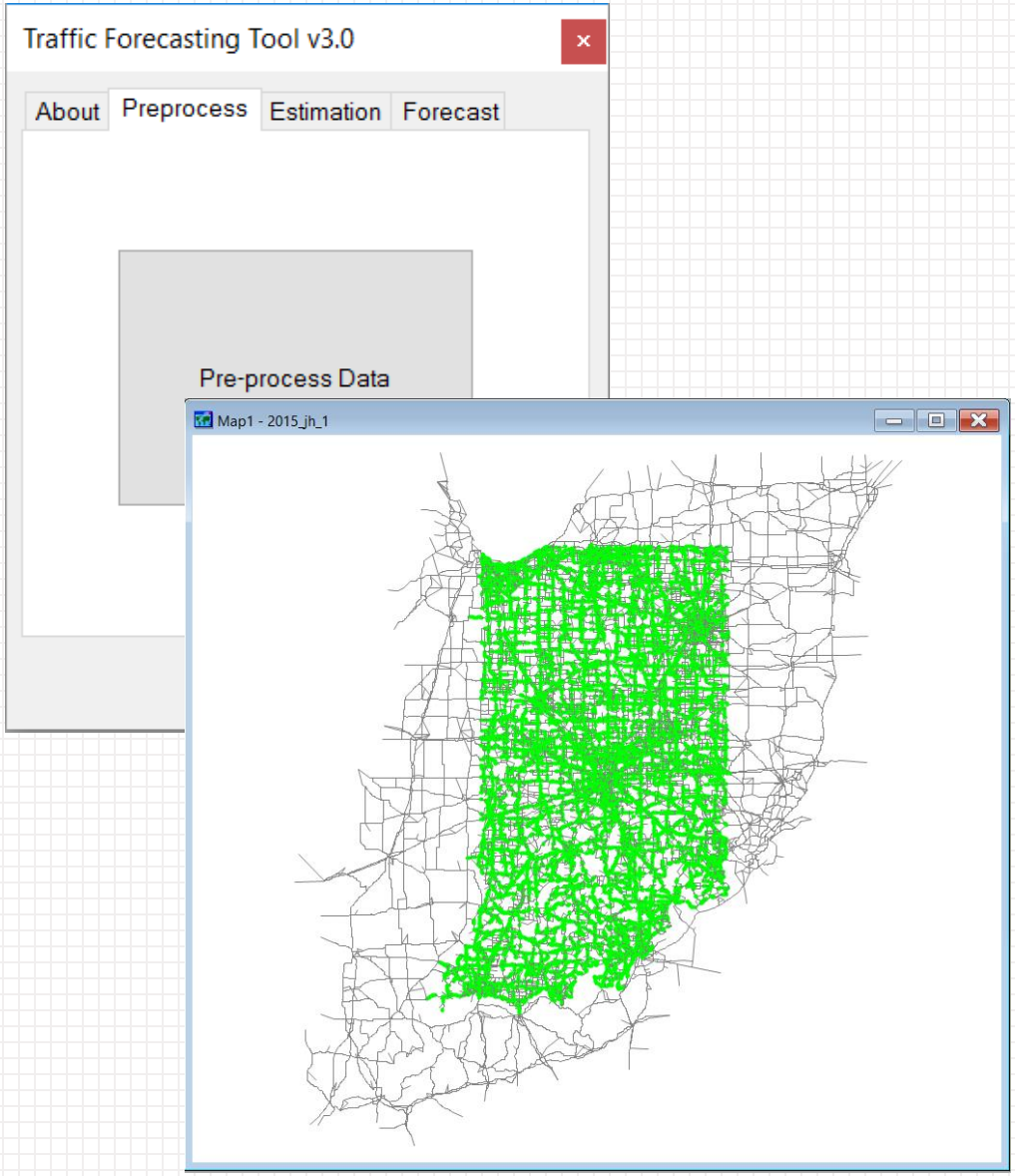


TFT v3.0 “Preprocess” Tab

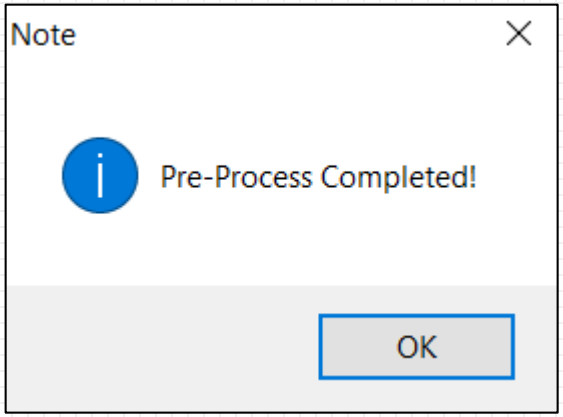


- **All-in-one button**
  - **Joins:**
    - 2015 ISTDM loaded network
    - 2035 ISTDM traffic loads
    - Historical traffic counts
  - **Green-highlights links with historical traffic data.**
  - **Displays centroid connectors as grey dashed lines**

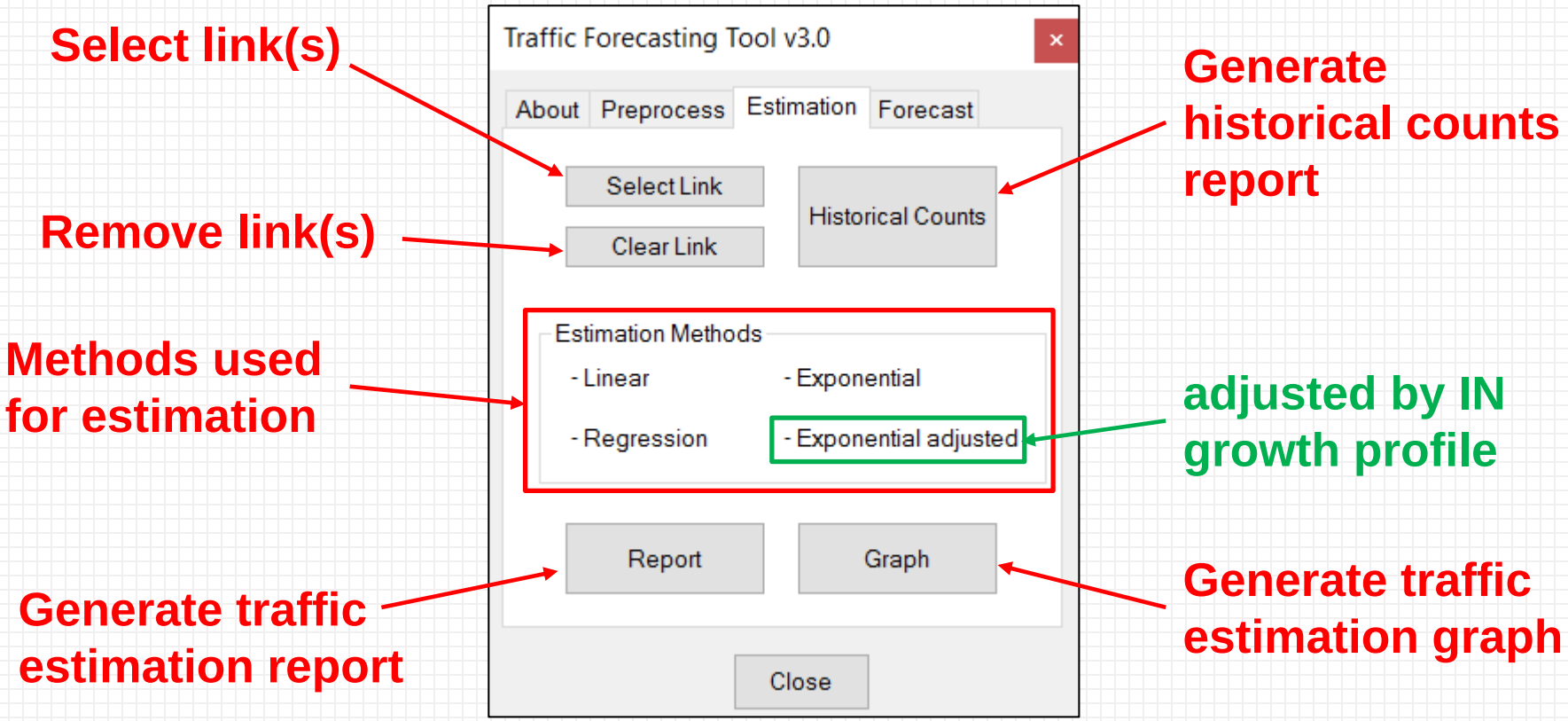
TFT v3.0 “Preprocess” Tab (cont.)



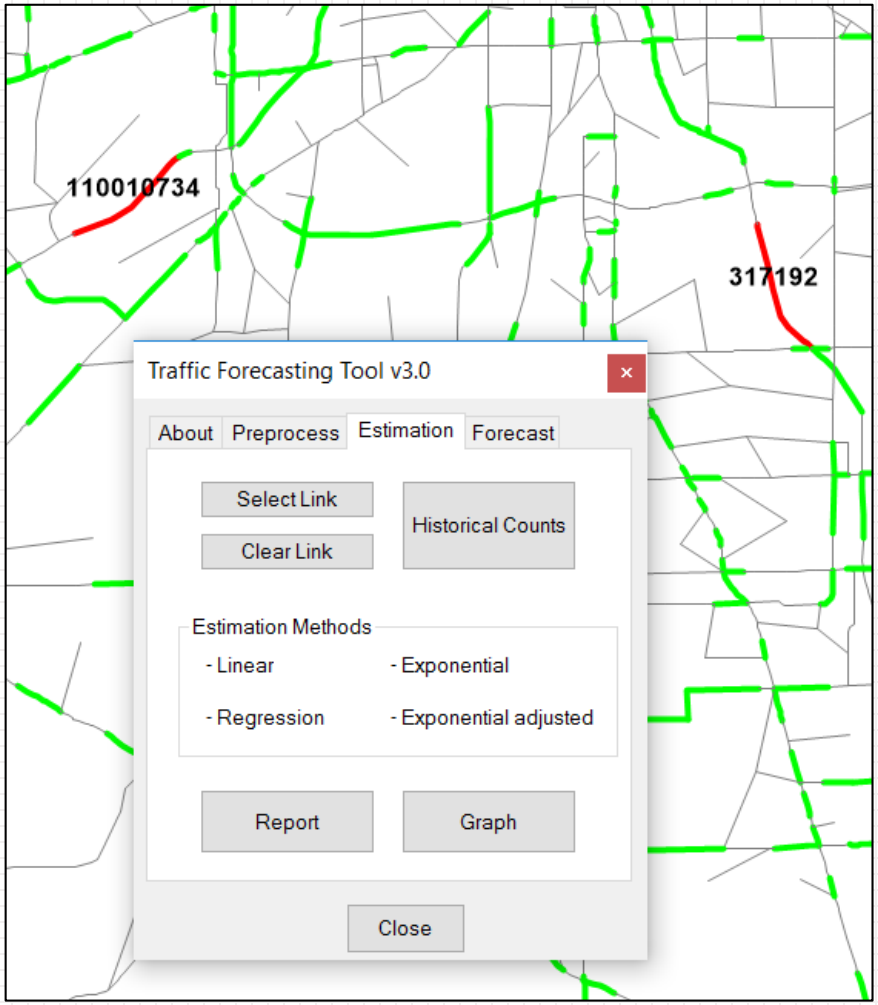
- **A message box confirms the completion of pre-processing data.**



TFT v3.0 “Estimation” Tab



Select & Clear Links



- **“Select Link” button**
  - select links.
  - TFT3 automatically red-highlights selected links and label link IDs.
- **“Clear Link” button**
  - remove all selected links

TFT v3.0 – Historical Counts Report

Link #1

Link #2

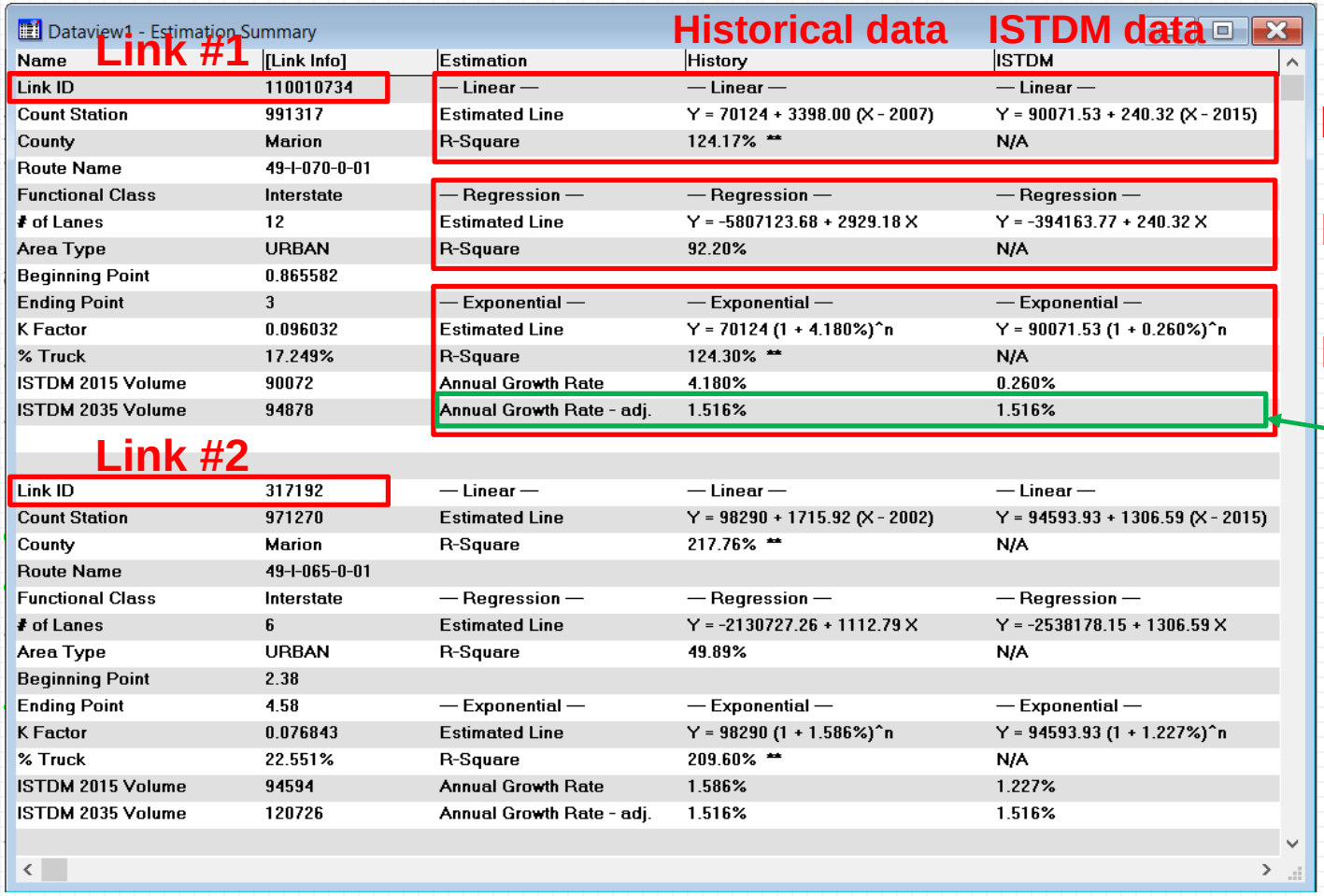
Dataview1 - Traffic Counts Summary

Name	[Link Info]	Year	AADT
Link ID	110010734	2001	0
Count Station	991317	2002	0
County	Marion	2003	0
Route Name	49-I-070-0-01	2004	0
Functional Class	Interstate	2005	0
# of Lanes	12	2006	0
Area Type	URBAN	2007	70124
Beginning Point	0.865582	2008	77088
Ending Point	3	2009	76978
K Factor	0.096032	2010	82945
% Truck	17.249%	2011	84189
		2012	81546
		2013	89360
		2014	91638
		2015	97308
		–	–
		–	–
Link ID	317192	2001	0
Count Station	971270	2002	98290
County	Marion	2003	0
Route Name	49-I-065-0-01	2004	0
Functional Class	Interstate	2005	0
# of Lanes	6	2006	0
Area Type	URBAN	2007	0
Beginning Point	2.38	2008	0
Ending Point	4.58	2009	0
K Factor	0.076843	2010	0
% Truck	22.551%	2011	108876
		2012	105381
		2013	104116
		2014	106407
		2015	120597
		–	–
		–	–

- **“Historical Counts” button – generate traffic count report**
  - Info organized by link
  - Key link attributes
  - 2001-2015 AADT
- **Report must be closed before having another one.**
- **“Save As…” as needed**

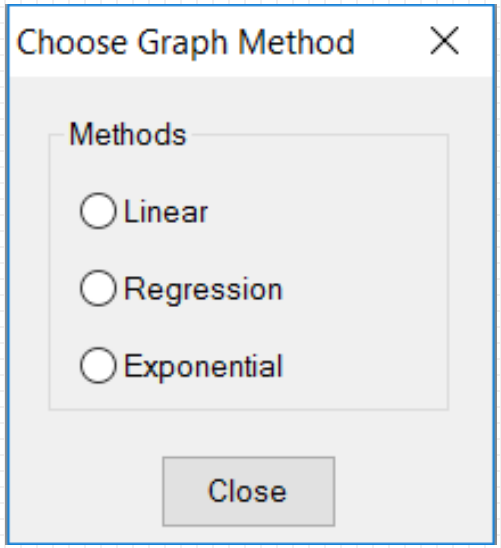
TFT v3.0 - Estimation Report

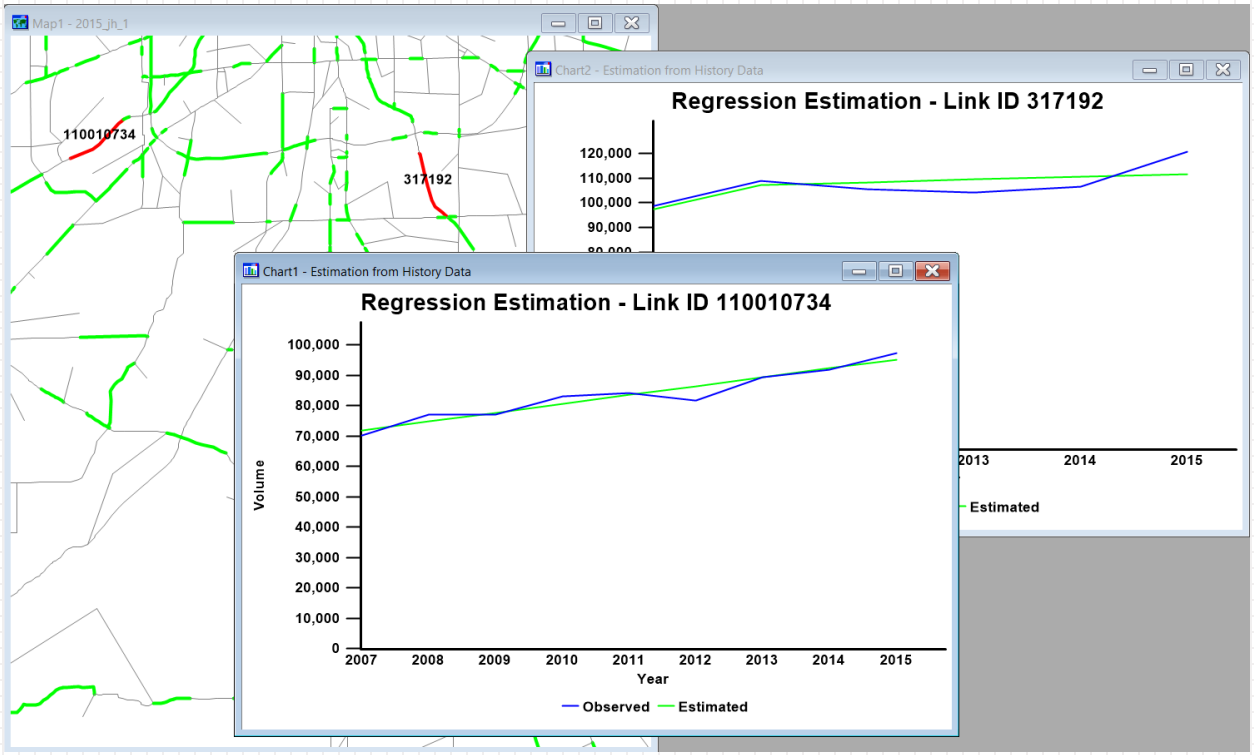
- **"Report" button – generate traffic estimation report**
- **Report must be closed before having another one. "Save As…" as needed.**



Name	[Link Info]	Estimation	History	ISTDM
Link ID	110010734	— Linear —	— Linear —	— Linear —
Count Station	991317	Estimated Line	Y = 70124 + 3398.00 (X - 2007)	Y = 90071.53 + 240.32 (X - 2015)
County	Marion	R-Square	124.17% **	N/A
Route Name	49-I-070-0-01			
Functional Class	Interstate	— Regression —	— Regression —	— Regression —
# of Lanes	12	Estimated Line	Y = -5807123.68 + 2929.18 X	Y = -394163.77 + 240.32 X
Area Type	URBAN	R-Square	92.20%	N/A
Beginning Point	0.865582			
Ending Point	3	— Exponential —	— Exponential —	— Exponential —
K Factor	0.096032	Estimated Line	Y = 70124 (1 + 4.180%)^n	Y = 90071.53 (1 + 0.260%)^n
% Truck	17.249%	R-Square	124.30% **	N/A
ISTDM 2015 Volume	90072	Annual Growth Rate	4.180%	0.260%
ISTDM 2035 Volume	94878	Annual Growth Rate - adj.	1.516%	1.516%
Link ID	317192	— Linear —	— Linear —	— Linear —
Count Station	971270	Estimated Line	Y = 98290 + 1715.92 (X - 2002)	Y = 94593.93 + 1306.59 (X - 2015)
County	Marion	R-Square	217.76% **	N/A
Route Name	49-I-065-0-01			
Functional Class	Interstate	— Regression —	— Regression —	— Regression —
# of Lanes	6	Estimated Line	Y = -2130727.26 + 1112.79 X	Y = -2538178.15 + 1306.59 X
Area Type	URBAN	R-Square	49.89%	N/A
Beginning Point	2.38			
Ending Point	4.58	— Exponential —	— Exponential —	— Exponential —
K Factor	0.076843	Estimated Line	Y = 98290 (1 + 1.586%)^n	Y = 94593.93 (1 + 1.227%)^n
% Truck	22.551%	R-Square	209.60% **	N/A
ISTDM 2015 Volume	94594	Annual Growth Rate	1.586%	1.227%
ISTDM 2035 Volume	120726	Annual Growth Rate - adj.	1.516%	1.516%

TFT v3.0 - Estimation Graph

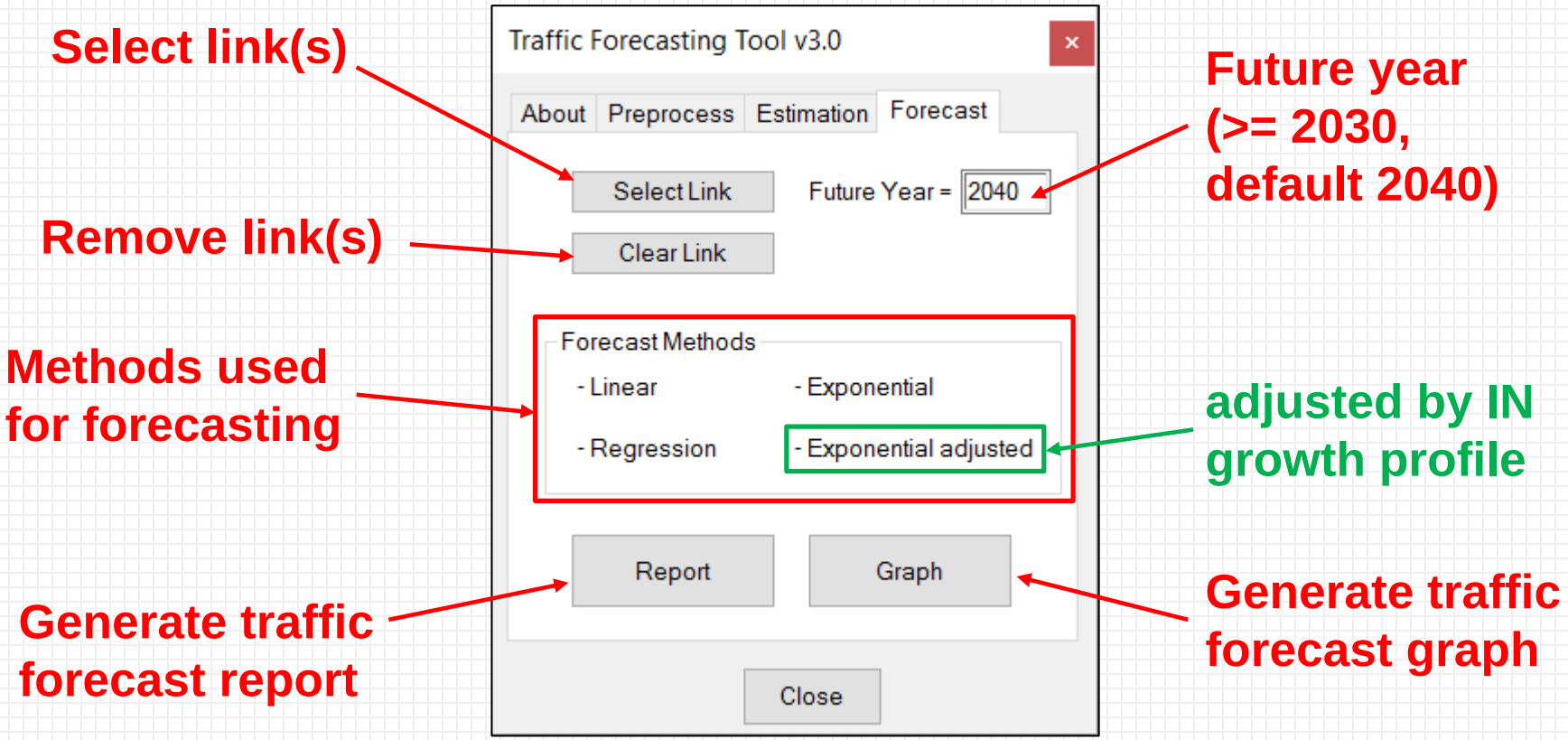




Graph(s) show:

- Historical traffic counts
- Fitted traffic volumes by selected method

TFT v3.0 “Forecast” Tab



TFT v3.0 - Forecast Report

- **"Report" button – generate traffic forecast report**
- **Report must be closed before having another one. "Save As…" as needed.**

Dataview2 - Forecast Summary

Link #1

Linear

Regression

Exponential

Adjusted Exponential

Name	[Link Info]	Year	Lin_History	Lin_ISTDM	Lin_NCHRP_255	Break	Reg_History	Reg_ISTDM	Reg_NCHRP_255	Break	Exp_History	Exp_ISTDM	Exp_NCHRP_255	Break3	Exp_Adj_History
Link ID	110010734	2015	97308	90072	97308		97308	90072	97308		97308	90072	97308		97308
Count Station	991317	2016	100706	90312	97558		98110	90312	97558		101376	90306	97552		98783
County	Marion	2017	104104	90552	97808		101039	90552	97808		105613	90541	97796		100281
Route Name	49-I-070-0-01	2018	107502	90792	98058		103968	90792	98058		110028	90777	98041		101801
Functional Class	Interstate	2019	110900	91033	98308		106897	91033	98308		114628	91013	98287		103344
# of Lanes	12	2020	114298	91273	98558		109827	91273	98558		119419	91250	98534		104911
Area Type	URBAN	2021	117696	91513	98808		112756	91513	98808		124411	91487	98781		106501
Beginning Point	0.865582	2022	121094	91754	99058		115685	91754	99058		129612	91725	99028		108116
Ending Point	3	2023	124492	91994	99308		118614	91994	99308		135030	91964	99277		109755
K Factor	0.096032	2024	127890	92234	99558		121543	92234	99558		140675	92203	99526		111419
% Truck	17.249%	2025	131288	92475	99808		124473	92475	99808		146555	92443	99775		113108
ISTDM 2015 Volume	90072	2026	134686	92715	100058		127402	92715	100058		152681	92684	100025		114823
ISTDM 2035 Volume	94878	2027	138084	92955	100308		130331	92955	100308		159064	92925	100276		116563
		2028	141482	93196	100558		133260	93196	100558		165713	93167	100528		118331
		2029	144880	93436	100808		136189	93436	100808		172640	93410	100780		120124
		2030	148278	93676	101058		139118	93676	101058		179857	93653	101033		121946
		2031	151676	93917	101308		142048	93917	101308		187375	93896	101287		123794
		2032	155074	94157	101557		144977	94157	101557		195208	94141	101541		125671
		2033	158472	94397	101807		147906	94397	101807		203368	94386	101796		127576
		2034	161870	94638	102057		150835	94638	102057		211869	94632	102051		129510
		2035	165268	94878	102307		153764	94878	102307		220726	94878	102307		131474
		2036	168666	95118	102557		156694	95118	102557		229953	95125	102564		133467
		2037	172064	95358	102807		159623	95358	102807		239565	95372	102822		135490
		2038	175462	95599	103057		162552	95599	103057		249579	95621	103080		137544
		2039	178860	95839	103307		165481	95839	103307		260012	95869	103339		139629
		2040	182258	96079	103557		168410	96079	103557		270882	96119	103598		141746
			–	–	–		–	–	–		–	–	–		–
			–	–	–		–	–	–		–	–	–		–
Link ID	317192	2015	120597	94594	120597		120597	94594	120597		120597	94594	120597		120597
Count Station	971270	2016	122313	95901	122083		112656	95901	122083		122509	95755	121917		122425
County	Marion	2017	124029	97207	123569		113769	97207	123569		124452	96930	123254		124281
Route Name	49-I-065-0-01	2018	125745	98514	125056		114882	98514	125056		126426	98119	124607		126165
Functional Class	Interstate	2019	127461	99820	126542		115995	99820	126542		128430	99323	125976		128078
# of Lanes	6	2020	129177	101127	128028		117107	101127	128028		130467	100542	127363		130020

Link #2

based on historical data

based on ISTDM data

NCHRP 255 adjustment

based on historical data

based on ISTDM data

NCHRP 255 adjustment

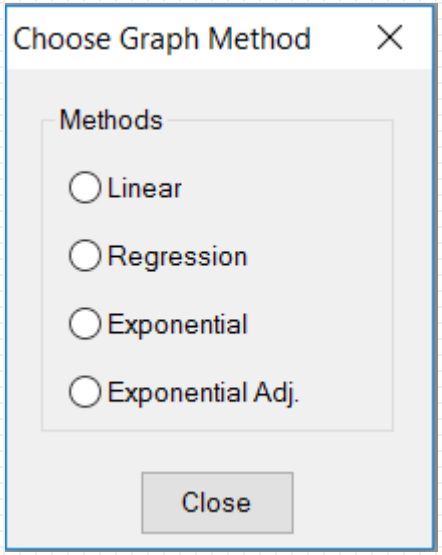
based on historical data

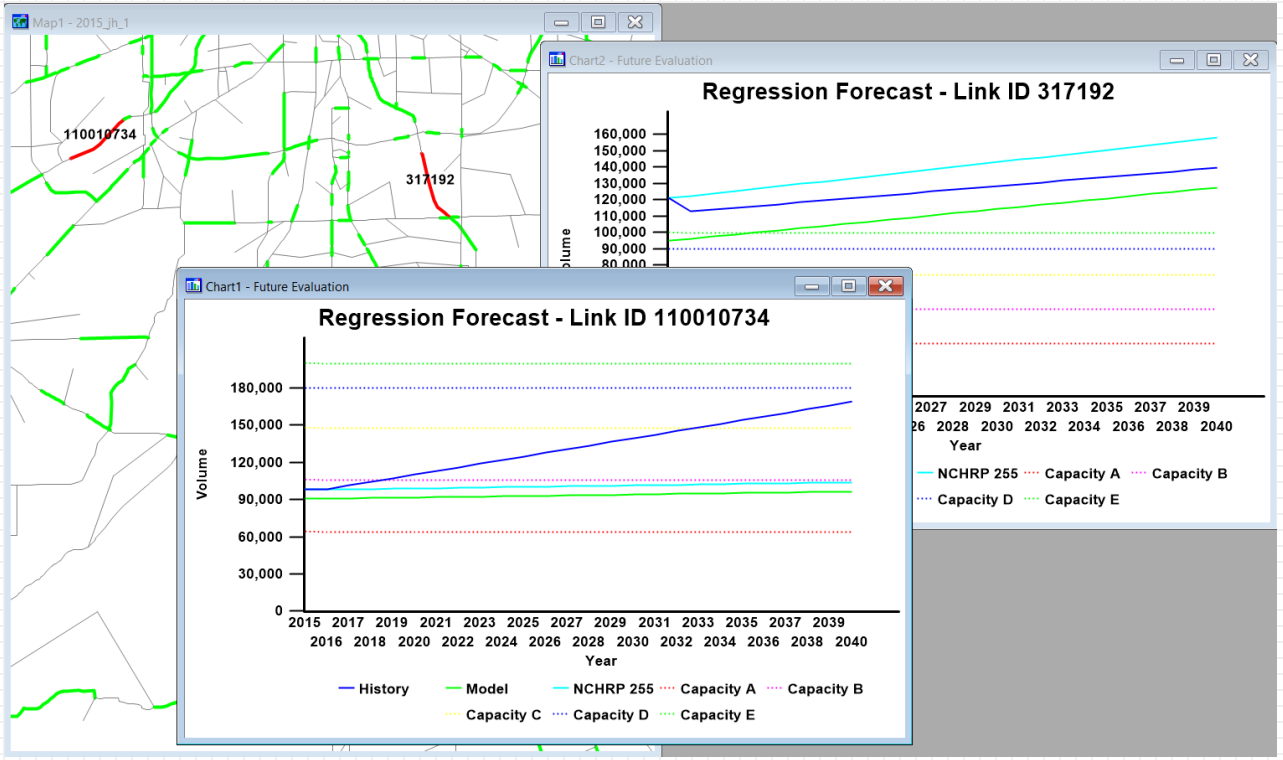
based on ISTDM data

NCHRP 255 adjustment

based on historical data

TFT v3.0 - Forecast Graph





Graph(s) show:

- Traffic forecast by historical data and selected method
- ISTDM 7 traffic forecast
- ISTDM 7 traffic forecast adjusted by NCHRP 255
- Capacities of LOS A - E

Potential Improvements to TFT v3.0

- **Cover all segments of state owned roads by creating and using a new linear reference system.**
- **Compatible with the newer version of ISTDM (being updated)**
- **Incorporate more information in the tool to meet INDOT's traffic forecasting needs**

Questions ?

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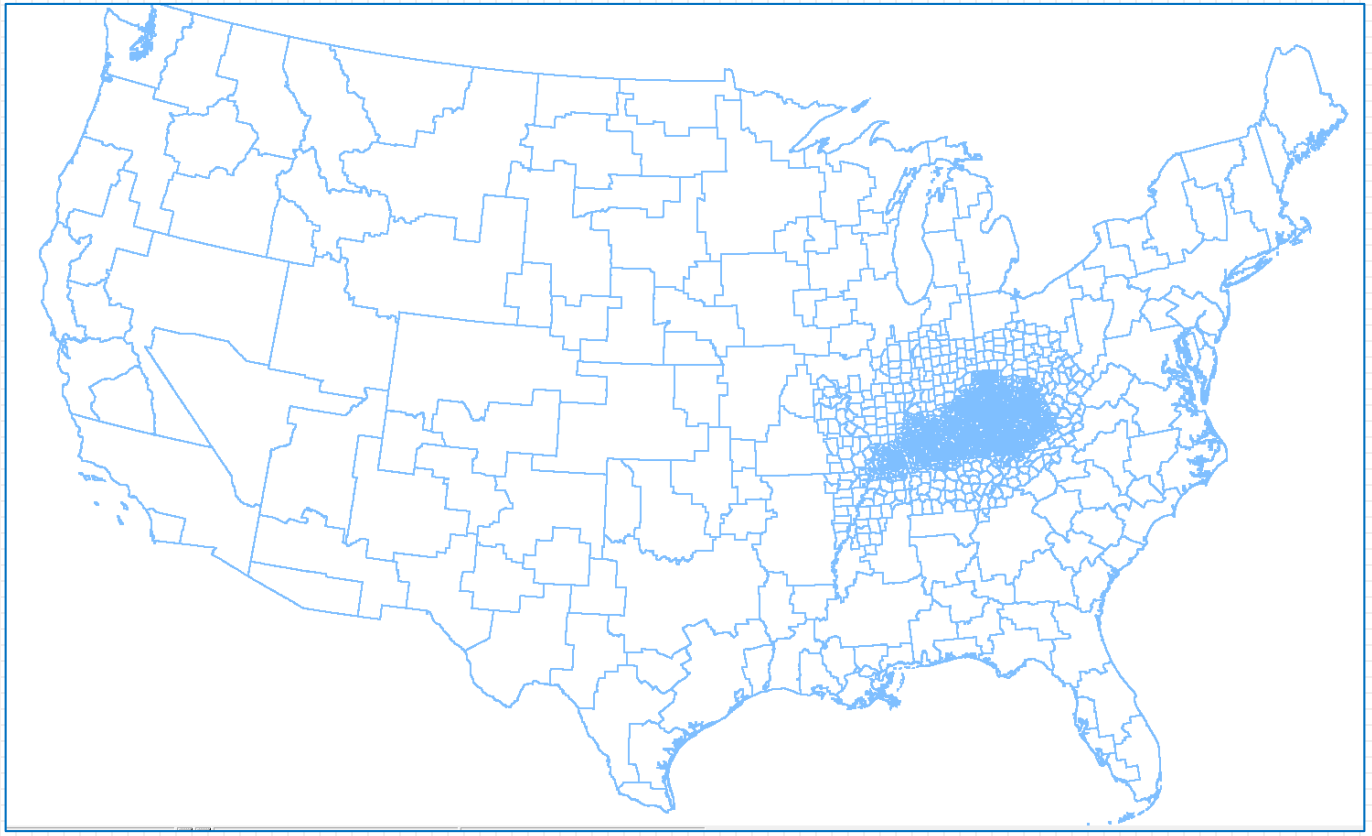
Part 2

KYTC TREDIS Post-Processor

Kentucky Statewide Model

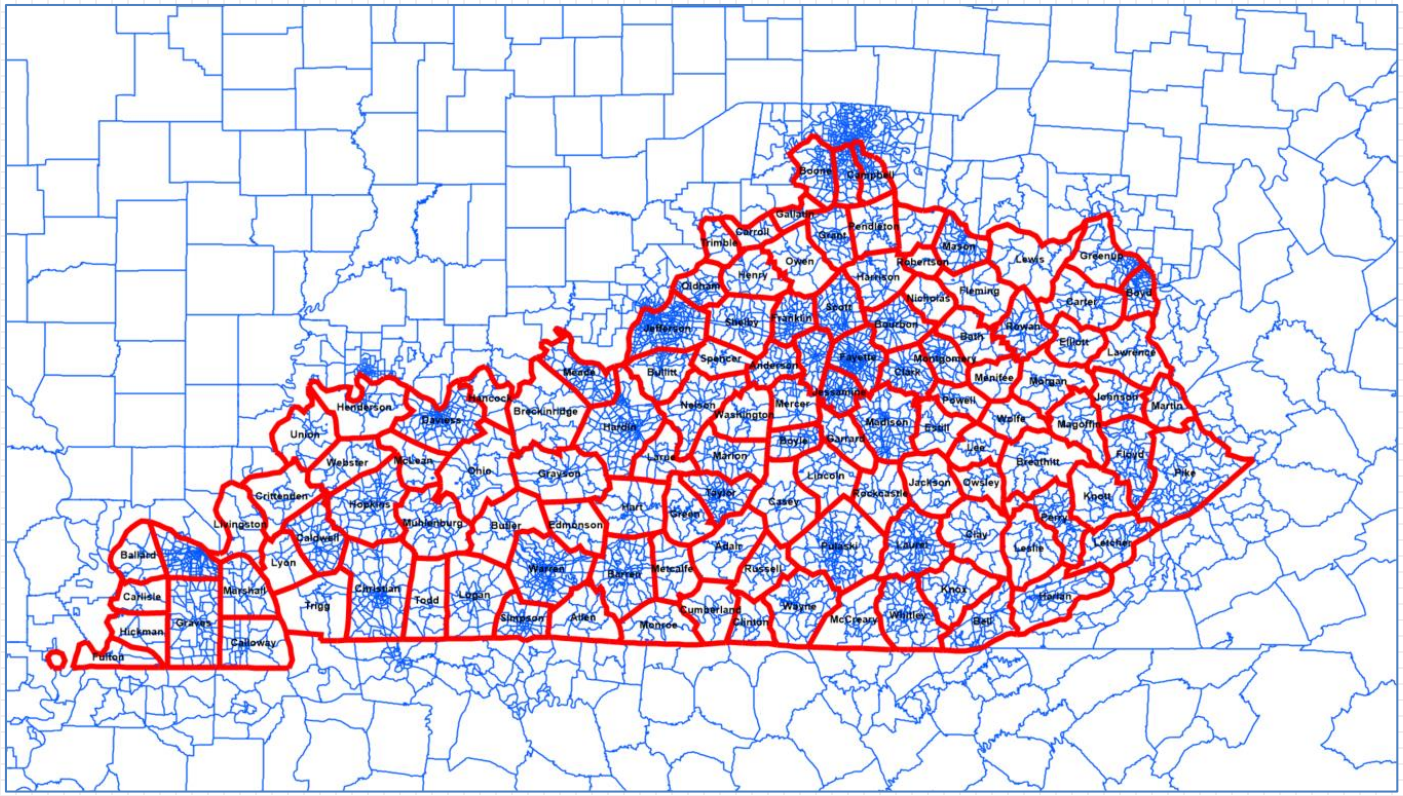
Traffic Analysis Zone Structure

- Cover U.S. mainland (5,843 zones)



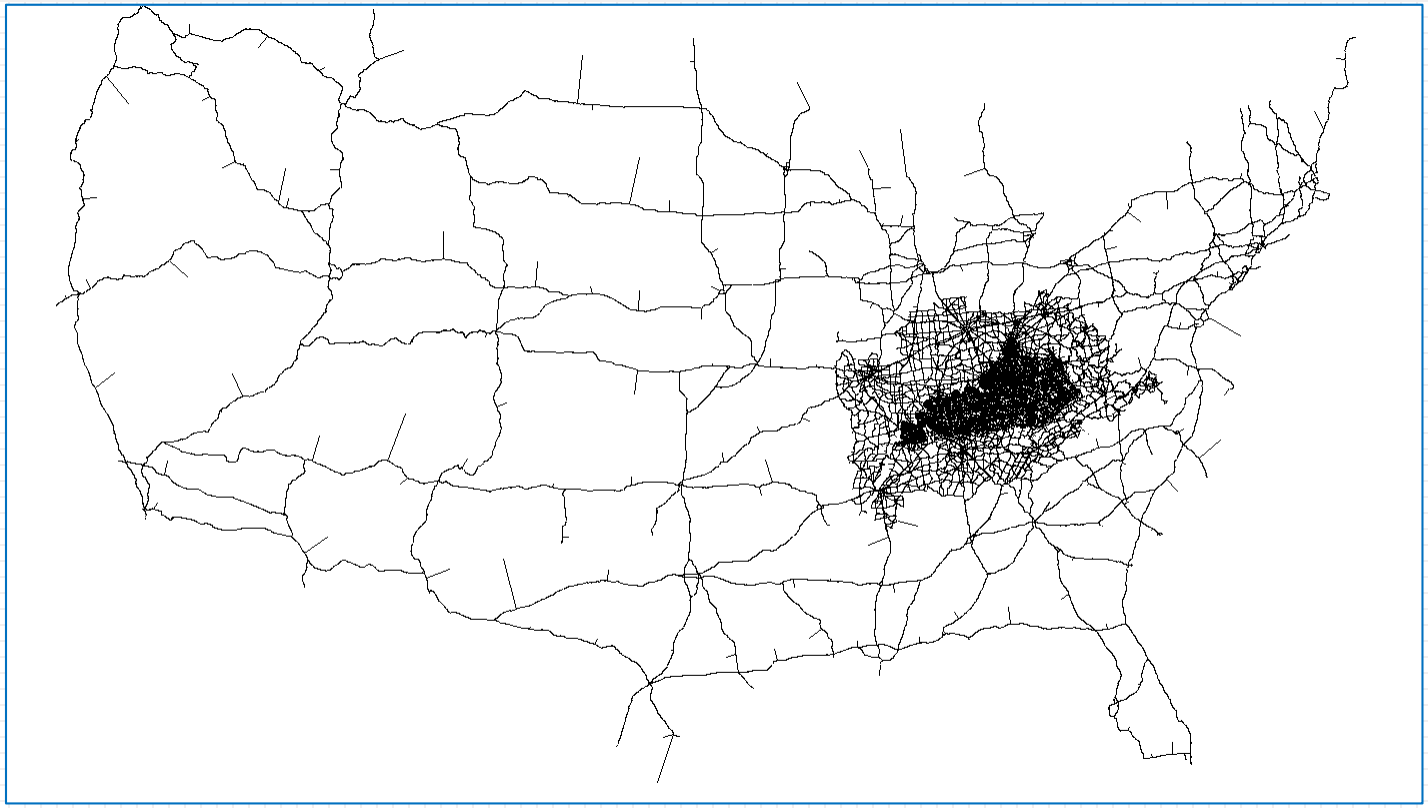
Traffic Analysis Zone Structure

- Detailed zones in Kentucky (4,624 zones)



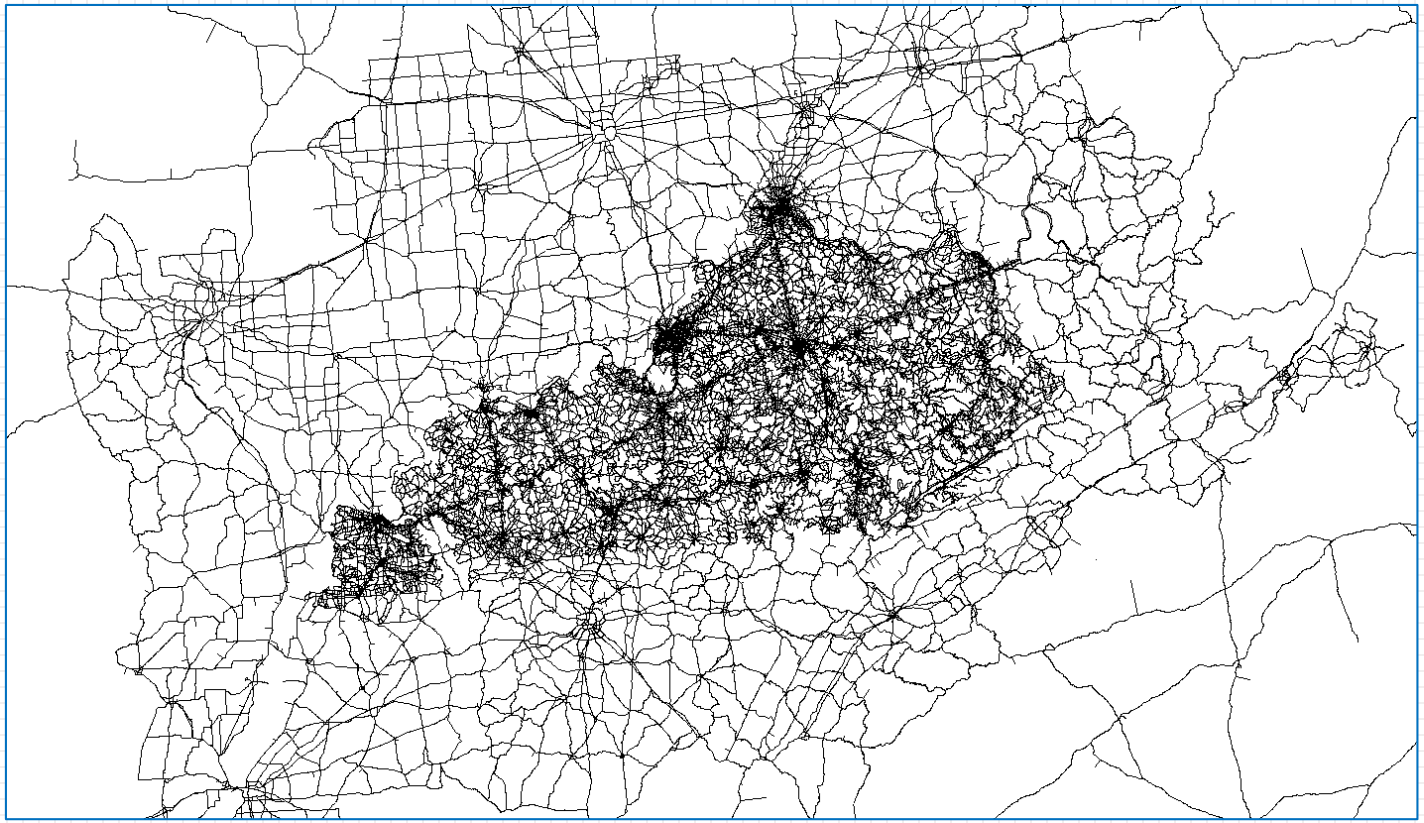
Model Network Structure

- More than 86,000 total links



Model Network Structure

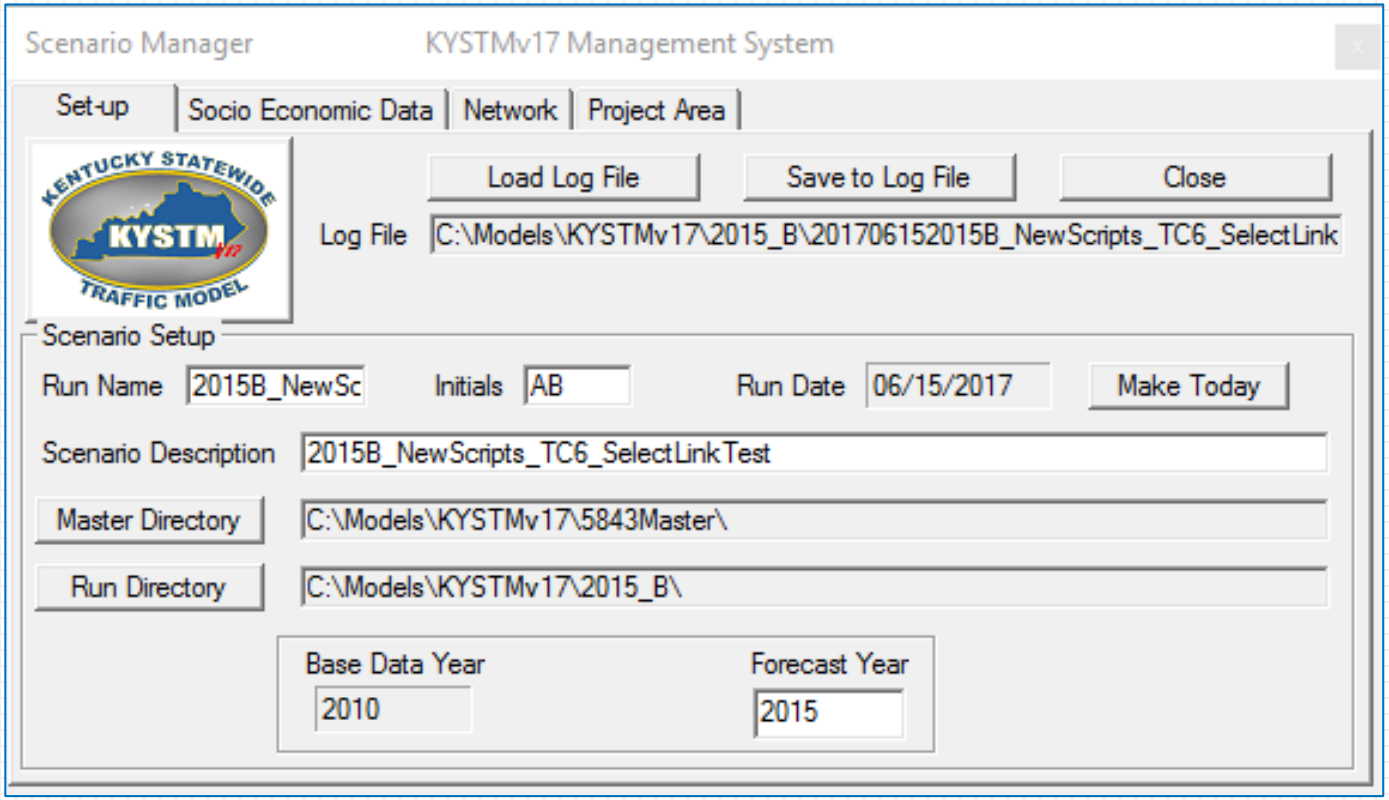
- More than 71,000 links in Kentucky



KYSTM Structure

- A 4-step daily model in TransCAD Version 6
- Model Run Steps
  - Speed/Capacity calculation
  - Truck trip generation, distribution and assignment
    - Single Unit Trucks
    - Combination Trucks
  - Auto trip generation, distribution and assignment (MMA)
    - HBW, HBO, NHB, Business, Tourist, Other long distance trips
  - Highway Evaluation

Kentucky Statewide Model User Interface



Travel Demand Model Post-Processor

- Developed for Kentucky Transportation Cabinet (KYTC) to prepare the required inputs for TREDIS (Transportation Economic Development Impact System)
  - Automatic process
  - Minimal manual effort
- The post-processor uses TDM output files. Therefore, the user must run the model for the desired scenario first.

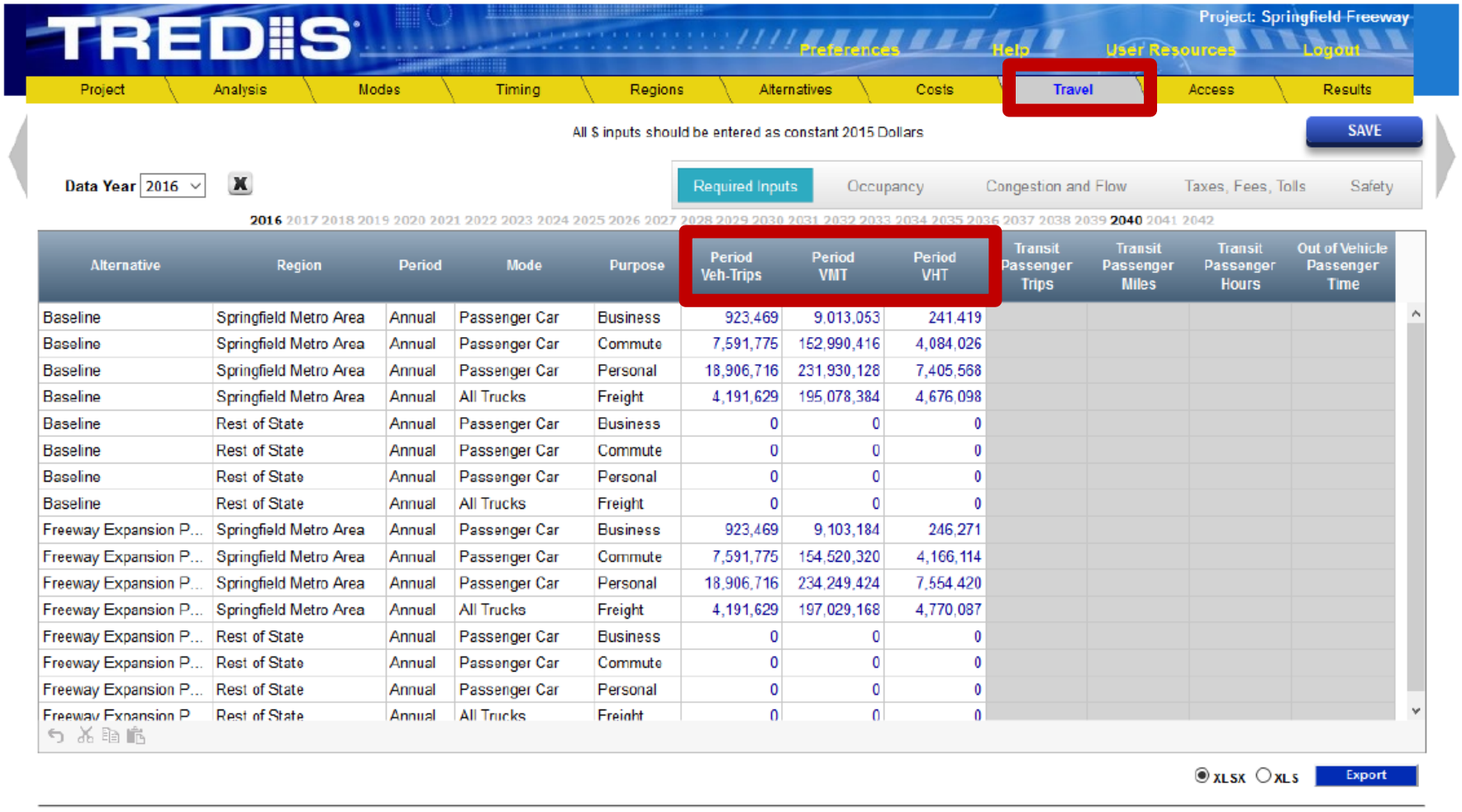
TREDIS

- Transportation Economic Development Impact System modeling software
  - Economic impact analysis,
  - Benefit-cost analysis,
  - Financial analysis,
  - Freight and trade impact analysis

- The only system applicable for all modes – covering passenger and freight transport via aviation, marine and rail modes, as well as truck, car, bus, bicycle, and pedestrian travel

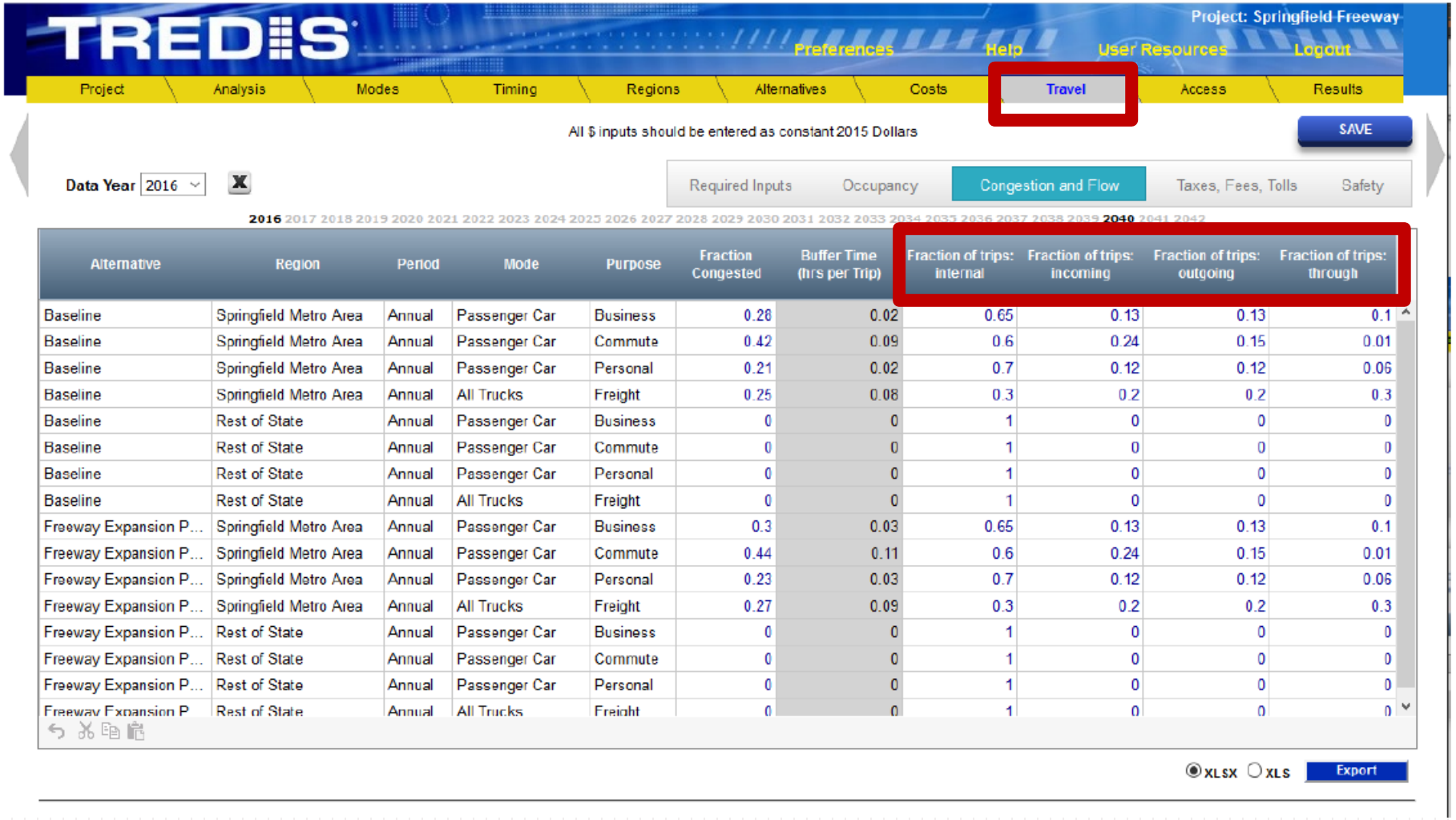
- TREDIS can be used to make an assessment of the transportation and economic benefits of the different projects and helps in the project selection process

Inputs Related to TDM



Alternative	Region	Period	Mode	Purpose	Period Veh-Trips	Period VMT	Period VHT	Transit Passenger Trips	Transit Passenger Miles	Transit Passenger Hours	Out of Vehicle Passenger Time
Baseline	Springfield Metro Area	Annual	Passenger Car	Business	923,469	9,013,053	241,419				
Baseline	Springfield Metro Area	Annual	Passenger Car	Commute	7,591,775	152,990,416	4,084,026				
Baseline	Springfield Metro Area	Annual	Passenger Car	Personal	18,906,716	231,930,128	7,405,568				
Baseline	Springfield Metro Area	Annual	All Trucks	Freight	4,191,629	195,078,384	4,676,098				
Baseline	Rest of State	Annual	Passenger Car	Business	0	0	0				
Baseline	Rest of State	Annual	Passenger Car	Commute	0	0	0				
Baseline	Rest of State	Annual	Passenger Car	Personal	0	0	0				
Baseline	Rest of State	Annual	All Trucks	Freight	0	0	0				
Freeway Expansion P...	Springfield Metro Area	Annual	Passenger Car	Business	923,469	9,103,184	246,271				
Freeway Expansion P...	Springfield Metro Area	Annual	Passenger Car	Commute	7,591,775	154,520,320	4,166,114				
Freeway Expansion P...	Springfield Metro Area	Annual	Passenger Car	Personal	18,906,716	234,249,424	7,554,420				
Freeway Expansion P...	Springfield Metro Area	Annual	All Trucks	Freight	4,191,629	197,029,168	4,770,087				
Freeway Expansion P...	Rest of State	Annual	Passenger Car	Business	0	0	0				
Freeway Expansion P...	Rest of State	Annual	Passenger Car	Commute	0	0	0				
Freeway Expansion P...	Rest of State	Annual	Passenger Car	Personal	0	0	0				
Freeway Expansion P	Rest of State	Annual	All Trucks	Freight	0	0	0				

Inputs Related to TDM – Cont'd

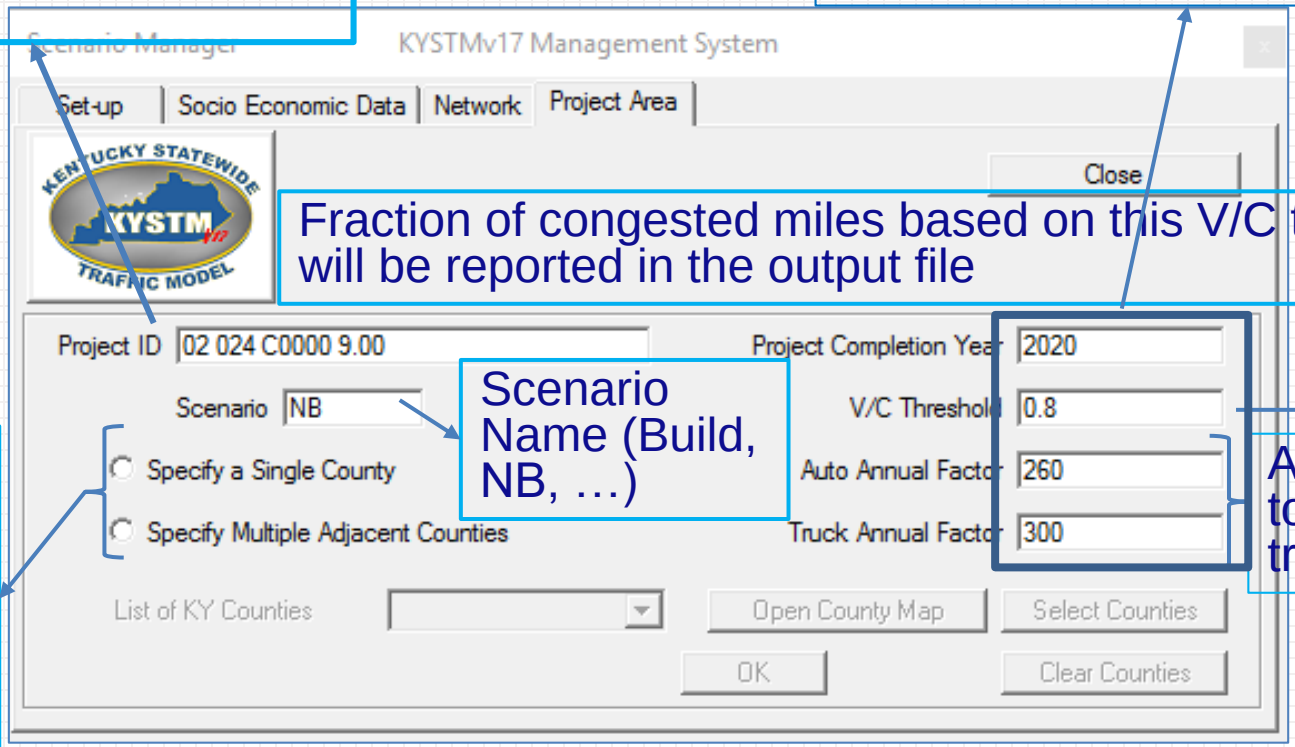


Alternative	Region	Period	Mode	Purpose	Fraction Congested	Buffer Time (hrs per Trip)	Fraction of trips: internal	Fraction of trips: incoming	Fraction of trips: outgoing	Fraction of trips: through
Baseline	Springfield Metro Area	Annual	Passenger Car	Business	0.28	0.02	0.65	0.13	0.13	0.1
Baseline	Springfield Metro Area	Annual	Passenger Car	Commute	0.42	0.09	0.6	0.24	0.15	0.01
Baseline	Springfield Metro Area	Annual	Passenger Car	Personal	0.21	0.02	0.7	0.12	0.12	0.06
Baseline	Springfield Metro Area	Annual	All Trucks	Freight	0.25	0.08	0.3	0.2	0.2	0.3
Baseline	Rest of State	Annual	Passenger Car	Business	0	0	1	0	0	0
Baseline	Rest of State	Annual	Passenger Car	Commute	0	0	1	0	0	0
Baseline	Rest of State	Annual	Passenger Car	Personal	0	0	1	0	0	0
Baseline	Rest of State	Annual	All Trucks	Freight	0	0	1	0	0	0
Freeway Expansion P...	Springfield Metro Area	Annual	Passenger Car	Business	0.3	0.03	0.65	0.13	0.13	0.1
Freeway Expansion P...	Springfield Metro Area	Annual	Passenger Car	Commute	0.44	0.11	0.6	0.24	0.15	0.01
Freeway Expansion P...	Springfield Metro Area	Annual	Passenger Car	Personal	0.23	0.03	0.7	0.12	0.12	0.06
Freeway Expansion P...	Springfield Metro Area	Annual	All Trucks	Freight	0.27	0.09	0.3	0.2	0.2	0.3
Freeway Expansion P...	Rest of State	Annual	Passenger Car	Business	0	0	1	0	0	0
Freeway Expansion P...	Rest of State	Annual	Passenger Car	Commute	0	0	1	0	0	0
Freeway Expansion P...	Rest of State	Annual	Passenger Car	Personal	0	0	1	0	0	0
Freeway Expansion P...	Rest of State	Annual	All Trucks	Freight	0	0	1	0	0	0

Post Processor User Interface

Unique ID of the project to be analyzed

Default values for the parameters as shown in the figure are suggested by KYTC



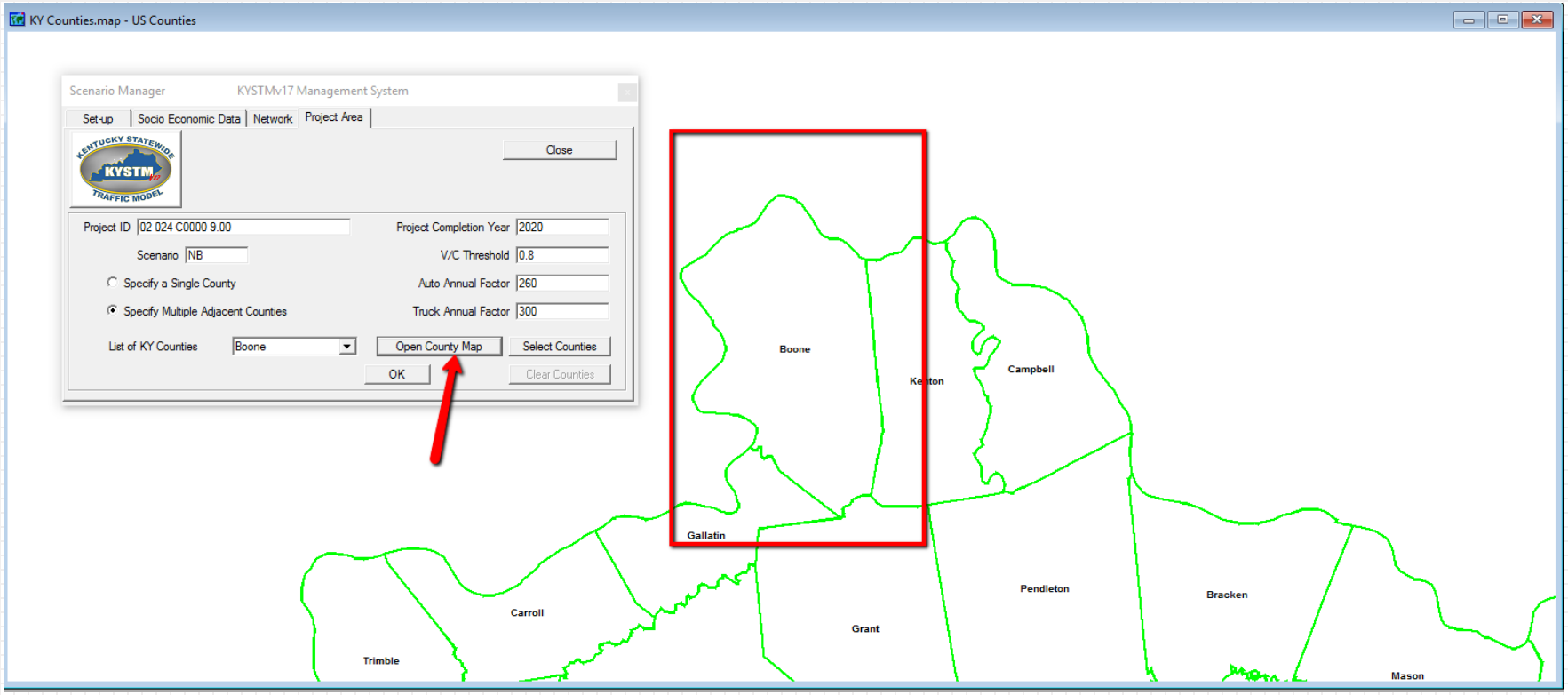
Fraction of congested miles based on this V/C threshold will be reported in the output file

Scenario Name (Build, NB, …)

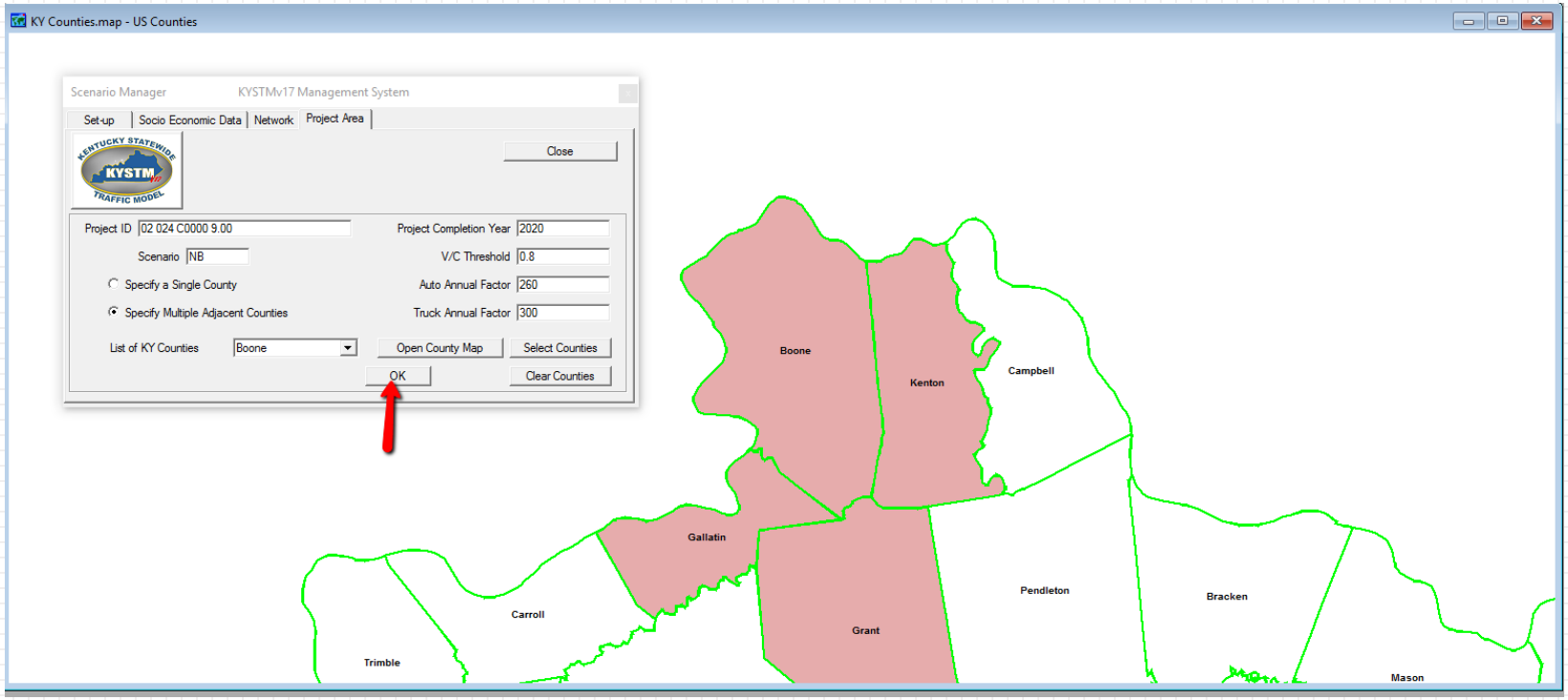
Two options to analyze either single or multiple counties

Annual factors to convert daily trips

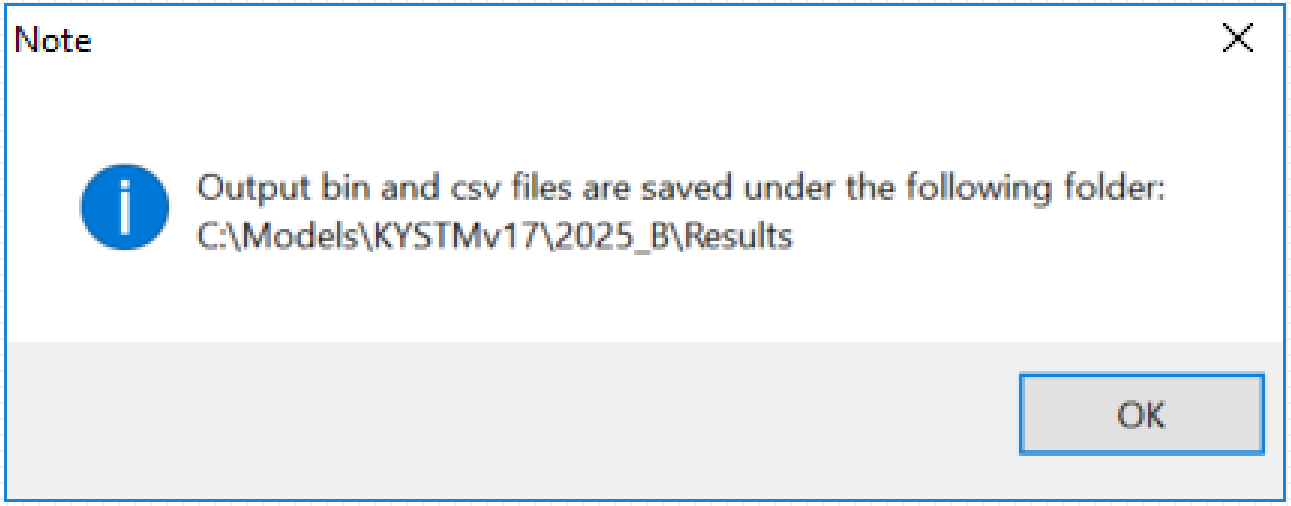
TREDIS User Interface – Selecting Multiple Counties



TREDIS User Interface – Running the Post-Processor



Post-Processor Run Completion



Output Files

- Output files are saved in .bin and .csv format
  - ➢ The values from the output files can be directly used as inputs to TREDIS

Purpose

# of Trips

VMT/VHT

II/EI/IE Trips

II/EI/IE Fractions

Dataview1 - TREDIS Summary_2017_NB_02 024 C

[Basic Info]	Value	Modes	[Vehicle Trips]	[Person Trips]	VMT	VHT	[I-I Trips]	[E-I Trips]	[I-E Trips]	[Fraction of I-I Trips]	[Fraction of E-I Trips]	[Fraction of I-E Trips]
Model Data	Daily	HBW	82173	92445	899965	18390	31511	25331	2533	0.383	0.308	0.308
County(ies)	Christian	HBO	99165	169671	710016	15310	72479	13343	1334	0.731	0.135	0.135
Project Completion Year	2017	NHB	61173	105218	407294	8838	46529	7322	732	0.761	0.120	0.120
Scenario	NB	SU Truck	14764	–	140020	2957	11442	1745	157	0.775	0.118	0.107
Project ID	02 024 C0000 9.00	Combo Truck	13392	–	316907	5581	8177	2754	246	0.611	0.206	0.184
Fraction of Congested Miles	0.019353	All POV	244416	372147	2339585	47803	150518	46949	4694	0.616	0.192	0.192
		All Trucks	28156	–	456926	8538	19620	4499	403	0.697	0.160	0.143
		All Vehicles	272572	372147	2795808	56330	170138	51448	5098	0.624	0.189	0.187
			–	–	–	–	–	–	–	–	–	–
			–	–	–	–	–	–	–	–	–	–
Model Data	Annual	HBW	21365109	24035748	233990881	4781423	8192789	6586160	6586160	0.383	0.308	0.308
County(ies)	Christian	HBO	25782918	44114573	184604280	3980533	18844457	3469231	3469231	0.731	0.135	0.135
Project Completion Year	2017	NHB	15904990	27356584	105896499	2297894	12097554	1903718	1903718	0.761	0.120	0.120
Scenario	NB	SU Truck	4429235	–	42005866	887244	3432694	523600	472940	0.775	0.118	0.107
Project ID	02 024 C0000 9.00	Combo Truck	4017523	–	95071975	1674188	2453161	826064	738298	0.611	0.206	0.184
Fraction of Congested Miles	0.019353	All POV	63548103	96758100	608292141	12428780	39134801	12206651	12206651	0.616	0.192	0.192
		All Trucks	8446758	–	137077841	2561431	5885855	1349664	1211238	0.697	0.160	0.143
		All Vehicles	71994861	96758100	745369982	14990212	45020656	13556315	13417889	0.625	0.188	0.186

Output Files – Cont'd

- **Basic Info & Value**: These two fields include the basic information about the scenario model run including the fraction of congested miles which is calculated based on the V/C Threshold parameter.
- **Modes**: A list of all modes (The new KYSTMv17 processes 6 different auto trip purposes as well as two truck trip purposes):

  Auto Trip purposes
  - Short Distance
    - HBW
    - HBO
    - NHB
  - Long Distance
    - Business
    - Tourist
    - OtherLD

  Truck Trip Purposes
  - Long Distance (Combination Trucks)
  - Short Distance (Single Unit Trucks)
- **Vehicle Trips:** Total number of vehicle trips by vehicle types and trip purposes
- **Person Trips:** Total Number of person trips by vehicle types and trip purposes
- **VMT:** Total vehicle miles traveled by each vehicle type and trip purpose
- **VHT:** Total vehicle miles traveled by each vehicle type and trip purpose

Output Files – Cont'd

- **I-I Trips:** Total internal-internal vehicle trips made by each vehicle type and trip purpose
- **E-I Trips:** Total external-internal vehicle trips by each vehicle type and trip purpose
- **I-E Trips:** Total internal-external vehicle trips by each vehicle type and trip purpose
- **Fraction of I-I Trips:** Fraction of total internal-internal vehicle trips by each vehicle type and trip purpose
- **Fraction of E-I Trips:** Fraction of total external-internal vehicle trips by each vehicle type and trip purpose
- **Fraction of I-E Trips:** Fraction of total internal-external vehicle trips by each vehicle type and trip purpose

Questions ?

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